

**IMPLEMENTASI *EDUCATION FOR SUSTAINABLE DEVELOPMENT*
(*ESD*) DAN PENCAPAIAN *LIFE SKILLS* PESERTA DIDIK
DI SEKOLAH ADIWIYATA MANDIRI**

TESIS

diajukan untuk memenuhi sebagian syarat untuk memperoleh gelar
Magister Pendidikan konsentrasi Pendidikan Biologi



Oleh:

INDIRA KARTIKA RAHAYU
1802942

**PROGRAM STUDI MAGISTER PENDIDIKAN BIOLOGI
SEKOLAH PASCASARJANA
UNIVERSITAS PENDIDIKAN INDONESIA
BANDUNG
2021**

**Implementasi *Education for Sustainable Development (ESD)* dan
Pencapaian *Life Skills* Peserta Didik
di Sekolah Adiwiyata Mandiri**

Oleh
Indira Kartika Rahayu

S.Pd UIN Sunan Gunung Djati Bandung, 2017

Sebuah Tesis yang diajukan untuk memenuhi salah satu syarat memperoleh gelar
Magister Pendidikan (M.Pd.) pada Fakultas Pendidikan Matematika dan Ilmu
Pengetahuan Alam

© Indira Kartika Rahayu 2021
Universitas Pendidikan Indonesia
Januari 2021

Hak Cipta dilindungi undang-undang.
Tesis ini tidak boleh diperbanyak seluruhnya atau sebagian,
dengan dicetak ulang, difoto kopi, atau cara lainnya tanpa ijin dari penulis.

Indira Kartika Rahayu, 2021
**IMPLEMENTASI EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD) DAN PENCAPAIAN LIFE
SKILLS PESERTA DIDIK DI SEKOLAH ADIWIYATA MANDIRI**
Universitas Pendidikan Indonesia | repository.upi.edu | perpustakaan.upi.edu

INDIRA KARTIKA RAHAYU

**IMPLEMENTASI *EDUCATION FOR SUSTAINABLE DEVELOPMENT*
(*ESD*) DAN PENCAPAIAN *LIFE SKILLS* PESERTA DIDIK
DI SEKOLAH ADIWIYATA MANDIRI**

Disetujui dan disahkan oleh:

Pembimbing I



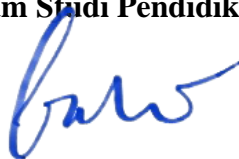
Prof. Dr. Yayan Sanjaya, M.Si
NIP. 197112312001121001

Pembimbing II



Dr. Rini Solihat, M.Si
NIP. 197902132001122001

**Mengetahui,
Ketua Program Studi Pendidikan Biologi**



Dr. Bambang Supriatno, M.Si
NIP. 196305211988031002

PERNYATAAN KEASLIAN TESIS

Dengan ini saya menyatakan bahwa tesis dengan judul “**Implementasi *Education for Sustainable Development (ESD)* dan Pencapaian *Life Skills* Peserta Didik di Sekolah Adiwiyata Mandiri**” ini beserta seluruh isinya adalah benar-benar karya sendiri, dan saya tidak melakukan penjiplakan atau pengutipan dengan cara-cara yang tidak sesuai dengan etika keilmuan yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung sanksi yang dijatuhkan kepada saya apabila kemudian ditemukan adanya pelanggaran terhadap etika keilmuan dalam karya saya ini atau klaim dari pihak lain terhadap keaslian karya saya ini.

Bandung, Januari 2021

Yang membuat pernyataan,

Indira Kartika Rahayu

1802942

KATA PENGANTAR

Alhamdulillah, segala puji dan syukur penulis panjatkan ke hadirat Allah SWT yang telah melimpahkan rahmat dan karunia-Nya sehingga penulis dapat menyelesaikan tesis yang berjudul “Implementasi *Education for Sustainable Development (ESD)* dan Pencapaian *Life Skills* Peserta Didik di Sekolah Adiwiyata Mandiri”.

Penulis menyadari bahwa skripsi ini masih banyak kekeliruan. Oleh karena itu dengan segala kerendahan hati, penulis mengharapkan saran dan kritik yang membangun dari para pembaca guna memperbaiki dan menyempurnakan tesis ini. Semoga tesis ini dapat bermanfaat bagi pembaca dan dunia pendidikan.

Bandung, Januari 2021

Penulis,

Indira Kartika Rahayu

UCAPAN TERIMA KASIH

Puji dan syukur penulis panjatkan ke hadirat Allah SWT, berkat rahmat dan ridho-Nya penulis dapat menyelesaikan tesis yang berjudul “Implementasi *Education for Sustainable Development (ESD)* dan Pencapaian *Life Skills* Peserta Didik di Sekolah Adiwiyata Mandiri”. Shalawat serta salam semoga dilimpahkan kepada Nabi Muhammad SAW, kepada keluarga, sahabat, serta kita sebagai umatnya. Dalam penyusunan tesis ini penulis menyadari sepenuhnya bahwa penyelesaian tesis ini tidak terlepas dari dukungan moril maupun spiritual serta bimbingan dan tuntunan dari berbagai pihak. Dalam kesempatan ini penulis mengucapkan terima kasih yang sebesar-besarnya kepada :

1. Bapak Dr. Bambang Supriatno, M.Si selaku ketua Departemen Pendidikan Biologi FPMIPA UPI Bandung.
2. Bapak Prof. Dr. Yayan Sanjaya, M.Si selaku Dosen Pembimbing I atas segala dedikasi, bantuan, bimbingan, saran, motivasi, dan inspirasinya yang diberikan kepada penulis selama proses penyusunan tesis ini.
3. Ibu Dr. Rini Solihat, M.Si selaku Dosen Pembimbing II atas segala dedikasi, bantuan, bimbingan, saran, motivasi, dan inspirasinya yang diberikan kepada penulis selama proses penyusunan tesis ini.
4. Ibu Dr. Mimin Nurjhani K, M.Pd selaku Dosen Pembimbing Akademik atas dedikasi, bantuan, bimbingan, saran, motivasi, dan inspirasinya yang diberikan kepada penulis selama kurang lebih dua tahun kegiatan perkuliahan berlangsung.
5. Bapak Dr. Riandi, M.Si dan Ibu Dr. Hj. Sri Anggraeni M.S selaku ahli judgement instrumen dalam penelitian ini.
6. Seluruh Dosen Departemen Pendidikan Biologi FPMIPA UPI Bandung yang telah memberikan ilmu dan pengetahuannya selama penulis menuntut ilmu di Sekolah Pasca Sarjana UPI Bandung.
7. Kepala Sekolah SMKN A dan SMKN B yang telah memberikan izin kepada penulis untuk melaksanakan penelitian.

8. Ibu-ibu guru mata pelajaran mikrobiologi di SMKN A dan SMKN B y telah membantu dalam melaksanakan penelitian ini.
9. Rekan-rekan seperjuangan S2 Pendidikan Biologi angkatan 2018 yang selama 2 tahun bersama-sama menimba ilmu dan berbagi keceriaan, semoga kita bisa menjalin silaturahmi dan sukses di masa yang akan datang.
10. Semua pihak yang tidak mungkin penulis sebutkan satu per satu yang telah memberikan bantuannya baik secara langsung maupun tidak langsung.

Semoga amal baik yang telah diberikan mendapatkan imbalan yang setimpal dari Allah SWT. Kritik dan saran yang sifatnya membangun akan senantiasa penulis tampung guna menjadi acuan dalam meningkatkan aplikasi penelitian ilmiah selanjutnya terutama yang relevan.

Bandung, Januari 2021

Penulis,

Indira Kartika Rahayu

ABSTRAK

IMPLEMENTASI *EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD)* DAN PENCAPAIAN *LIFE SKILLS* PESERTA DIDIK DI SEKOLAH ADIWIYATA MANDIRI

**Indira Kartika Rahayu
1802942**

Penelitian ini bertujuan untuk menganalisis implementasi *Education for Sustainable Development (ESD)* dan pencapaian *life skills* peserta didik di Sekolah Adiwiyata Mandiri. Desain penelitian yang digunakan yaitu deskriptif eksploratif. Instrumen penelitian terdiri dari pedoman wawancara, kuesioner terbuka, analisis program model CIPP, lembar analisis dokumen RPP, lembar observasi guru dan peserta didik, tes pengetahuan *ESD*, kuesioner sikap, dan kuesioner *life skills*. Hasil temuan dari penelitian ini yaitu 1) Implementasi *ESD* di SMKN Adiwiyata ditunjukkan dengan adanya kebijakan program terkait *ESD*. Program kebijakan meliputi kebijakan kurikuler dan nonkurikuler, program yang dibuat sudah disesuaikan dengan komponen dan target yang ada di dalam *ESD*. 2) Keterlaksanaan dari program kebijakan terkait *ESD* di SMKN Adiwiyata Mandiri sudah berjalan dengan baik dan dapat diterima, namun pelaksanaannya belum maksimal dan masih membutuhkan perbaikan. Secara keseluruhan keterlaksanaan program kebijakan di SMKN Adiwiyata Mandiri sudah baik dalam mengimplementasikan *ESD*. 3) Proses pembelajaran mikrobiologi di SMKN Adiwiyata mengintegrasikan *ESD* ke dalam kegiatan pembelajaran yang mengandung komponen *ESD* di dalamnya. KD yang digunakan berkaitan dengan pencapaian target *SDG* No. 3 dan *SDG* No.12. 4) Keterampilan *life skills* peserta didik di SMKN Adiwiyata Mandiri yang mempelajari materi kualitas air dan makanan pada pembelajaran mikrobiologi berjalan dengan baik. Peserta didik bertanggung jawab terhadap kemampuan dirinya, sosial, akademik dan vokasionalnya.

Kata kunci : Implementasi, *ESD*, Adiwiyata, *Life Skills*, Mikrobiologi

ABSTRACT

IMPLEMENTATION OF EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD) AND ACHIEVEMENTS OF STUDENTS' LIFE SKILLS AT INDEPENDENT ADIWIYATA SCHOOL

**Indira Kartika Rahayu
1802942**

This study aims to analyze the implementation of Education for Sustainable Development (ESD) and the Achievement of Students' Life Skills at the Independent Adiwiyata School. The research design used is descriptive exploratory. The research instrument consisted of interview guides, open-ended questionnaires, analysis of the CIPP model program, lesson plan analysis, teacher and student observation sheets, ESD knowledge tests, attitude questionnaires, and life skills questionnaires. Research data shows that: 1) Implementation of ESD at Adiwiyata Vocational High School (AVHS) is indicated by the existence of program policies related to ESD. Policy programs include curricular and non-curricular policies, programs made adjusted to the components and targets in ESD. 2) The implementation of the ESD-related policy program at AVHS has gone well and is acceptable, however, the implementation is not yet optimal and still needs improvement. Overall, this implementation of the policy program at AVHS is already in some good category in implementing ESD. 3) The microbiology learning process at AVHS remains characterized by integrating ESD into learning activities that contain ESD components. The basic competencies used by teachers are related to achieving SDG 3 and SDG 12. 4) The life skills of students at AVHS that study water and food quality materials in microbiology learning are running well. Students are responsible for their social, academic, and vocational abilities.

Keywords : Implementation, ESD, Adiwiyata, Life Skills, Microbiology

DAFTAR ISI

HALAMAN PENGESAHAN.....	i
PERNYATAAN KEASLIAN TESIS	ii
KATA PENGANTAR	iii
UCAPAN TERIMA KASIH.....	iv
ABSTRAK	vi
ABSTRACT.....	vii
DAFTAR ISI.....	viii
DAFTAR TABEL.....	x
DAFTAR GAMBAR	xii
DAFTAR LAMPIRAN	xiii
BAB I. PENDAHULUAN	1
1.1 Latar Belakang	1
1.2 Rumusan Masalah	7
1.3 Tujuan	7
1.4 Manfaat	8
1.5 Batasan Masalah.....	8
1.6 Stuktur Organisasi Tesis	9
BAB II. KAJIAN TEORI KONSEP <i>ESD</i> , IMPLEMENTASI <i>ESD</i> , <i>LIFE SKILLS</i> , DAN HASIL PENELITIAN YANG RELEVAN.....	11
2.1 Konsep <i>Education for Sustainable Develoment (ESD)</i>	11
2.2 Implementasi <i>ESD</i>	24
2.3 <i>Life Skills</i>	67
2.4 Hasil Penelitian yang Relevan	76
BAB III. METODE PENELITIAN.....	79
3.1 Definisi Operasional	79
3.2 Desain Penelitian	79
3.3 Partisipan.....	80
3.4 Instrumen	80
3.5 Pengembangan Instrumen	94

Indira Kartika Rahayu, 2021

IMPLEMENTASI EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD) DAN PENCAPAIAN LIFE SKILLS PESERTA DIDIK DI SEKOLAH ADIWIYATA MANDIRI

Universitas Pendidikan Indonesia | repository.upi.edu | perpustakaan.upi.edu

3.6 Analisis Data	97
3.7 Prosedur Pelaksanaan Penelitian	98
3.8 Alur Penelitian	101
BAB IV. TEMUAN DAN PEMBAHASAN	102
4.1 Analisis Kebijakan <i>Education for Sustainable Development (ESD)</i> di Sekolah Adiwiyata Mandiri	102
4.2 Keterlaksanaan Program terkait <i>ESD</i>	116
4.3 Implementasi <i>ESD</i> dalam Pembelajaran Mikrobiologi	123
4.4 Ketercapaian <i>Life Skills</i> Peserta Didik SMK Adiwiyata Mandiri	131
BAB V. SIMPULAN, IMPLIKASI DAN REKOMENDASI	135
A. Simpulan	135
B. Implikasi	136
C. Rekomendasi	136
DAFTAR PUSTAKA	138
LAMPIRAN	154

DAFTAR TABEL

Tabel 2.1 <i>Framework</i> Kurikulum <i>ESD</i>	23
Tabel 3.1 Instrumen Penelitian	81
Tabel 3.2 <i>Kisi-Kisi Wawancara Manajemen Sekolah</i>	82
Tabel 3.3 Kisi-Kisi Kuesioner Terbuka untuk Guru Terkait <i>Education for Sustainable Development (ESD)</i>	83
Tabel 3.4 Kisi-kisi Instrumen Implementasi Kebijakan Program di Sekolah Adiwiyata Mandiri	84
Tabel 3.5 Kisi-Kisi Lembar Analisis Dokumen RPP	85
Tabel 3.6 Kisi-Kisi Lembar Observasi Aktivitas Guru dalam Kegiatan Pembelajaran melalui Zoom meeting	86
Tabel 3.7 Kisi-Kisi Lembar Observasi Aktivitas Peserta Didik dalam Kegiatan Pembelajaran melalui Zoom meeting.....	87
Tabel 3.8 Kisi-Kisi Lembar Observasi Aktivitas Guru dalam Kegiatan Pembelajaran melalui Google Classroom	88
Tabel 3.9 Kisi-Kisi Lembar Observasi Aktivitas Peserta Didik dalam Kegiatan Pembelajaran melalui Google Classroom	89
Tabel 3.10 Kisi-Kisi Tes Pengetahuan <i>Education for Sustainable Development (ESD)</i>	90
Tabel 3.11 Kisi-Kisi Kuesioner Sikap terhadap <i>Education for Sustainable Development (ESD)</i>	91
Tabel 3.12 Kisi-kisi Kuesioner Aspek <i>Life Skills</i> dalam Pembelajaran Mikrobiologi Materi Kualitas Air dan Makanan	93
Tabel 4.1 Deskripsi Program Sekolah terkait ESD di SMKN Adiwiyata Mandiri.	102
Tabel 4.2 Deskripsi Informasi Guru terhadap Kebijakan Program terkait <i>ESD</i> dalam bidang Kurikuler.....	104
Tabel 4.3 Deskripsi Informasi Guru terhadap Kebijakan Program terkait <i>ESD</i> dalam bidang Non-Kurikuler	109
Tabel 4.4 Skor Evaluasi Manajemen Sekolah terhadap program terkait <i>ESD</i> berdasarkan Model CIPP.....	117

Indira Kartika Rahayu, 2021

IMPLEMENTASI EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD) DAN PENCAPAIAN LIFE SKILLS PESERTA DIDIK DI SEKOLAH ADIWIYATA MANDIRI

Universitas Pendidikan Indonesia | repository.upi.edu | perpustakaan.upi.edu

Tabel 4.5 Data Penilaian Analisis RPP di SMKN Adiwiyata Mandiri.....	123
Tabel 4.6 Hasil Observasi Proses Pembelajaran Mikrobiologi.....	126
Tabel 4.7 Skor Pengetahuan Peserta Didik tentang <i>ESD</i>	128
Tabel 4.8 Skor Sikap Peserta Didik tentang <i>ESD</i>	131
Tabel 4.9 Kuesioner Aspek-Aspek <i>Life Skills</i> Peserta Didik pada Pembelajaran Mikrobiologi	132

DAFTAR GAMBAR

Gambar 2.1. Bagan Konsep Kecakapan Hidup.....	74
Gambar 3.1. Bagan Alur Penelitian	101
Gambar 4.1. Pemanfaatan <i>Ecobrick</i> di Sekolah.....	111
Gambar 4.2. Spanduk Duta Lingkungan Sekolah.....	112
Gambar 4.3. Tempat sampah organik dan anorganik	112
Gambar 4.4. Fasilitas Galon Air Isi Ulang yang disediakan oleh sekolah.....	114
Gambar 4.5 Proses Pembelajaran di SMKN A Menggunakan <i>Zoom Meeting</i>	126
Gambar 4.6 Proses Pembelajaran menggunakan <i>Google Classroom</i>	127
Gambar 4.7 Tujuan Pembelajaran dalam RPP Guru di SMKN A	128
Gambar 4.8 Tujuan Pembelajaran dalam RPP Guru di SMKN B	129
Gambar 4.9. Evaluasi Pembelajaran di Sekolah adiwiyata.....	130

DAFTAR LAMPIRAN

LAMPIRAN A. INSTRUMEN

Lampiran A.1. Pedoman Wawancara	154
Lampiran A.2. Instrumen Kuesioner Terbuka Guru SMK	156
Lampiran A.3. Instrumen CIPP	157
Lampiran A.4. Instrumen Lembar Analisis Dokumen RPP.	159
Lampiran A.5. Instrumen Lembar Observasi Guru dan Peserta Didik.....	161
Lampiran A.6 Instrumen Tes <i>ESD</i>	166
Lampiran A.7. Instrumen Kuesioner Sikap <i>ESD</i>	172
Lampiran A.8. Instrumen Kuesioner <i>Life Skills</i>	174

LAMPIRAN B. ANALISIS DATA

Lampiran B.1. Wawancara Manajemen Sekolah	177
Lampiran B.2. Analisis Kuesioner Guru SMK.....	183
Lampiran B.3. Analisis Data CIPP	188
Lampiran B.4. Analisis Lembar Dokumen RPP.....	192
Lampiran B.5. Analisis Lembar Observasi Guru dan Peserta Didik	194
Lampiran B.6 Analisis Tes Pengetahuan <i>ESD</i>	198
Lampiran B.7. Analisis Sikap	201
Lampiran B.8. Analisis <i>Life Skills</i>	205
Lampiran B.9. Dokumentasi Penelitian.....	210
Lampiran B.10. Dokumentasi Dokumen Kebijakan Sekolah.....	214
Lampiran B.11 Surat Izin Penelitian	235

DAFTAR PUSTAKA

- Agyei, D., Kwarteng, O.J., Akabanda, F. & Akomea, F.S. (2019). Indigenous African Fermented Dairy Products: Processing Technology, Microbiology and Health Benefits. *Journal of Food and Science Nutrition*, 1(1), 1-16. doi: <https://doi.org/10.1080/10408398.2018.1555133>.
- Ahmad, S.I., Abubakar, B.B., & Yau, S. (2018). Biology Education a Panacea for Sustainable National Development. *Journal of Environmental Microbiology*, 4(2), 71-74. doi: 10.11648/j.fem.20180402.14.
- Akdon, R. (2007). *Rumus dan Data dalam Aplikasi Statistika*. Bandung: Alfabeta.
- Akker, V.J., Gravemeijer, K., McKenney, S. & Nieveen, N. (2006). *Educational design research*. London: Routledge.
- Ali, M. (2015). *Education for National Development: A Case Study of Indonesia*. Bandung: Imperial Bhakti Utama Publishing Co.
- Ali, M. (2017). *Curriculum Development for Sustainability Education*. Bandung: UPI Press.
- Alividza, V. dkk. (2018). Investigating the Impact of Poverty on Colonization and Infection with Drug-Resistant Organisms in Humans: A Systematic Review. *Journal of Infectious Diseases of Poverty*, 7(76), 1-11. doi: <https://doi.org/10.1186/s40249-018-0459-7>.
- Amador, F., Martinho, A.P., Bacelar-Nicolau, P., Caeiro, S. & Oliveira, C.P. (2015). Education for Sustainable Development in Higher Education: Evaluating Coherence Between Theory and Praxis. *Journal of Assessment & Evaluation in Higher Education*, 40(6), 867–882.
- Anand, D. & Anuradha, R.K. (2016). Life Skill Based Education for Sustainable Future of Adolescent Girls. *Journal of Home Science*, 2(2): 213-217.
- Anastas, P.T. & Warner, J.C. (1998). *Green Chemistry Theory and Practice*. New York: Oxford University.
- Anderson, R. & Helms, J.V. (2001). The Ideal of Standards and the Reality of Schools: Needed Research. *Journal of Research in Science Teaching*, 38(1), 3-16. doi: [https://doi.org/10.1002/1098-2736\(200101\)38:1<3::AID-TEA2>3.0.CO;2-V](https://doi.org/10.1002/1098-2736(200101)38:1<3::AID-TEA2>3.0.CO;2-V).
- Anyolo, E.O. (2018). Implementing Education for Sustainable Development in Namibia: School Teachers Perceptions and Teaching Practices. *Journal of Teacher Education for Sustainability*, 20(1), 64-81. doi: <https://doi.org/10.2478/jtes-2018-0004>.
- Arikunto, S. (2007). *Prosedur Penelitian Suatu Pendekatan Praktek*. Jakarta: Rineka Cipta.
- Arikunto, S. (2013). *Dasar-Dasar Evaluasi Pendidikan*. Jakarta: Bumi.

- Arisanty, D. dkk. (2018). Evaluation of Adiwiyata Program Implementation in SMAN 1 Martapura. *Journal of Social Science Education and Humanities*, 274(1), 46-59. doi: [10.2991/iccite-18.2018.11](https://doi.org/10.2991/iccite-18.2018.11).
- Asmani. (2009). *Sekolah Life Skills Lulus Siap Kerja!*. Yogyakarta: DIVA Press.
- Azwar, Saifuddin. (2016). *Sikap Manusia: Teori & Pengukurannya Edisi ke-2*. Yogyakarta: Pustaka Pelajar.
- Baiquni, dkk. (2015). *Education For Sustainable Development. Merajut Pengalaman*. Yogyakarta: Universitas Gajah Mada Press.
- Beans, C. (2018). *News Feature: Can Microbes Keep Time for Forensic Investigators?*. [Online]. Diakses dari <https://www.pnas.org/content/pnas/115/1/3.full.pdf> [19 Agustus 2020].
- Belova, N. & Eilks, I. (2014). Using Advertisings to Introduce Inquiry and Societal Oriented Science Education. *Journal of Centre for Educational Policy Studies*, 4(1), 31-49.
- Burcelin, R. (2016). When Gut Fermentation Controls Satiety: A PYY Story. *Journal of Molecular Metabolism*, 6(1), 10–11. doi: [10.1016/j.molmet.2016.11.005](https://doi.org/10.1016/j.molmet.2016.11.005).
- Bradley, J.D. (2005). Chemistry Education for Development. *Chemical Education International*. [Online]. Diakses dari <http://old.iupac.org/publications/-cei/vol6/index.html>.
- Breiting, S., Mayer, M., & Mogensen, F. (2005). *Quality Criteria for ESD-Schools*. Vienna: ENSI.
- Brown, G.Z., Kline, J., Mhuireach, G., Northcutt, D., & Stenson, J. (2016). Making Microbiology of the Built Environment Relevant to Design. *Journal of Microbiome*, 4(6), 1-2. doi: [10.1186/s40168-016-0152-7](https://doi.org/10.1186/s40168-016-0152-7).
- Brundiers, K., Wiek, A. & Redman, C.L. (2010). Real-World Learning Opportunities Insustainability: from Classroom into the Real World. *Journal of Sustainable in Higher Education*, 11(1), 308–324.
- Burmeister, M., & Eilks, I. (2012). An Example of Learning About Plastics and Their Evaluation as A Contribution to Education for Sustainable Development in Secondary School Chemistry Teaching. *Journal of Chemistry Education*, 13(1), 93-102.
- Burmeister, M., & Eilks, I. (2013). German Chemistry student teachers‘ and trainee teachers‘ understanding of sustainability and Education for Sustainable Development. *Journal of Science Education International*, 24(2), 167-194.
- Calder, W. & Clugston, R. (2005). Shaping the Practical Role of Higher Education for a Sustainable Development. *Konferensi Internasional*, University College Worcester & University of Wales, United Kingdom.
- Cars, O. & Jasovsky, D. (2015). *Brief of GSDR 2015: Antibiotic Resistance—Nosustainability Without Antibiotics. News And Opinion*. [Online]. Diakses

- dari <https://www.reactgroup.org/news-and-views/news-and-opinions/year-2015/no-sustainability-without-antibiotics/2015>.
- Casadevall, A. (2015). Achieving SPEAKER Gender Equity at the American Society for Microbiology General Meeting. *Journal of Microbiology*, 6(4), 1–15. doi: 10.1128/mBio.01146-15.
- Cavicchioli, R. dkk. (2019). Scientists' Warning to Humanity: Microorganisms and Climate Change. *Journal of Nature Review Microbiology*, 17(1), 569–586. doi: <https://doi.org/10.1038/s41579-019-0222-5>.
- Chattaraj, S.K. (2017). Education for Sustainable Development. *Journal of Trend in Scientific*, 2(1), 131-134. doi: <https://doi.org/10.31142/ijtsrd5889>.
- Chauhan, V., Singh, V. & Tiwari, A. (2016). Microbial Terrorism – A Boon to Terrorists and Threat to Human Society. *Journal of Biotechnology and Biochemistry*, 2(1), 26–35.
- Cincera, J. & Krajhanzl, J. (2013). Eco-Schools: what factors influence pupils' action competence for pro-environmental behaviour?. *Journal of Cleaner Production*, 61(1), 117-121. doi: <http://dx.doi.org/10.1016/j.jclepro.2013.06.030>.
- Cotton, D. & Winter, J. (2010). *It's Not Just Bits of Paper and Light Bulbs: A Review of Sustainability Pedagogies and Their Potential for Use in Higher Education*. In: Jones P, Selby D, Sterling SR (eds) *Sustainability education: perspectives and practice across higher education*. London: Earthscan.
- Creswell, J.W. (2005). *Educational Research: Planning, Conducting and Evaluating Quantitative and Qualitative Research 2nd Edition*. New Jersey: Pearson Merrill Prentice Hall.
- Cueva, M.E. & Horsfall, L.E. (2017). The Contribution of Microbially Produced Nanoparticles to Sustainable Development Goals. *Journal of Microbiology and Biotechnology*, 10(1), 1212–1215.
- Damjanovic, K., Blackall, L.L. & Webster, N.S. (2017). The Contribution of Microbial Biotechnology to Mitigating Coral Reef Degradation. *Journal of Microbiology and Biotechnology*, 10(1), 1236–1243.
- De Bele, N., Wang, J., De Muynck, W., Manso, B.S. & Perez, S.I. (2014). Microbial Interaction with Mineral Building Materials. *Journal of Technology and Engineering*, 42(1), 563–567.
- De Haan, G. (2006). The BLK '21' Programme in Germany: a 'Gestaltungskompetenz'-Based Model for Education for Sustainable Development. *Journal of Environmental Education Research*, 12(1) 19 – 32.
- Deming, D.J.(2017). The Growing Importance of Social Skills in the Labor Market. *The Quarterly Journal of Economics*, 132(4), 1593-1640.

- Depdiknas. (2002). *Pendidikan Berorientasi Kecakapan Hidup (Life Skills) melalui Pendekatan Pendidikan Berbasis Luas (Broad Based Education)*. Jakarta: Tim BBE.
- Dimitrova, E. (2014). The Sustainable Development Concept in Urban Planning Education: Lessons Learned on A Bulgarian Path. *Journal of Cleaner Production*, 62(1), 120–127.
- Dupuy, K. dkk. (2018). *Life Skills in non-formal contexts for adolescent girls in developing countries. CMI Report*. Brookings: Centre of Universal Education.
- Ealias, A.M., Saravanakumar, M.P. (2017). A Review on the Classification, Characterization, Synthesis of Nanoparticles and Their Application. *Journal of Physics*, 263(3), 1-15. doi: 10.1088/1757-899X/263/3/032019.
- Elizabeth, A.C. dkk. (2020). Education for Sustainable Development Through Extra-curricular or Non-curricular Contexts. *Journal Education for Sustainable Development*, 1(1), 249-258.
- Eilks, I. (2002). Teaching Biodiesel: A Sociocritical and Problem-Oriented Approach to Chemistry Teaching, and Students' First Views in it. *Journal of Chemistry Education Research and Practice*, 3(1), 67-75.
- Eilks, I., Nielsen, J.A. & Hofstein, A. (2014). Learning About the Role of Science in Public Debate as An Essential Component of Scientific Literacy. *Journal of Science Education*, 1(1), 85-100.
- Eilks, I. (2015). Science Education and Education for Sustainable Development – Justifications, Models, Practices and Perspectives. *Journal of Mathematics, Science & Technology Education*, 11(1), 149-158.
- Erasmus. (2016). *A Roadmap to An ESD School*. [Online]. Diakses dari: https://ecoroad.weebly.com/uploads/3/5/3/8/3538216/ecoroad_roadmap_to_an_esd_school.pdf [12 Agustus 2020].
- Erulkar, A. & Medhin, G. (2014). *Evaluation of Health and Education Impacts of a Girls' Safe Spaces Program in Addis Ababa*. Addis Ababa: Population Council.
- Eskow, E., Rao, R.V.S. & Mordechai, E. (2001). *Concurrent Infection of the Central Nervous System by Borrelia Burgdorferi and Bartonella Henselae*. *Journal of Neurology*, 58(9), 1357–1363. doi: 10.1001/archneur.58.9.1357.
- Evans, C., Hogarth, S., & Parvin, J. (2004). *Children Challenging Industry: Analysis of CCI Project Data 5 Years*. York: University of York.
- Fadeeva, Z., Payyappallimana, U. & Petry, R. (2012). *Editorial: Learning and Innovation for Greener and Social just Societies*. in Z. Fadeeva, U. Payyappallimana, & R. Petry (Eds), *Towards More Sustainable Consumption and Production Systems and Sustainable Livelihoods* (pp. 8–27). Yokohama: United Nations University, Institute of Advanced Studies.

- Fagunwa, O.E. & Olanbiwoninu, A.A. (2020). Accelerating the Sustainable Development Goals through Microbiology: Some Efforts and Opportunities. *Journal of Access Microbiology*, 2(5), 1-11. doi: 10.1099/acmi.0.000112.
- FAO., IFAD., UNICEF., WFP. & WHO. (2019). *The State of Food Security and Nutrition in the World 2019: Safeguarding Against Economic Slowdowns and Downturns*. Rome: FAO.
- Feierabend, T. & Eilks, I. (2010). Raising Students' Perception of the Relevance of Science Teaching and Promoting Communication and Evaluation Capabilities Using Authentic and Controversial Socio-Scientific Issues in the Framework of Climate Change. *Journal of Science Education*, 21(1), 176-196.
- Feierabend, T. & Eilks, I. (2011). Teaching the Societal Dimension of Chemistry Using A Socio-Critical and Problem-Oriented Lesson Plan on Bioethanol Usage. *Journal of Chemical Education*, 88(1), 1250–1256.
- Felgner, S., Pawar, V., Kocijancic, D., Erhardt, M. & Weiss, S. (2017). Tumour Targeting Bacteria Based Cancer Therapies for Increased Specificity and Improved Outcome. *Journal of Microbiology and Biotechnology*, 10(1), 1074–1078.
- Ferreira, J., Ryan, L. & Tilbury, D. (2006). *Whole-school Approaches to Sustainability: A Review of Models for Professional Development in Pre-service Teacher Education*. Canberra: Australian Government Department of the Environment and Heritage and the Australian Research Institute in Education for Sustainability (ARIES).
- Festinger, L. (1957). *A Theory of Cognitive Dissonance*. Stanford: Stanford University Press.
- Fetissov, S.O. (2017). Role of the Gut Microbiota in Host Appetite Control: Bacterial Growth to Animal Feeding Behaviour. *Journal of Endocrinol*, 13(1), 11–25.
- Filho, W.L. (2018). *Handbook of Sustainability Science and Research*. Cham: Springer International Publishing.
- Filho, W.L., Azul, A.M., Brandli, B., Özuyar, P.G., Wall, T. (2020). *Encyclopedia of the UN Sustainable Development Goals*. Chester: Springer.
- Flegr, J. & Kuba, R. (2016). The Relation of *Toxoplasma* Infection and Sexual Attraction to Fear, Danger, Pain, and Submissiveness. *Journal of Evolutionary in Psychology*, 14(1), 1–10.
- Fujii, H. (2020). Education for Sustainable Development Goals and Challenges of Science Education. *Conference on ICMScE (International on Mathematics and Science Education)*. (hlm. 1-5). Bandung: UPI.
- Fraenkel, J. R. & Norman, E.W. (2012). *How to Design and Evaluate Research in Education 8th Edition*. Boston: McGraw-Hill Higher Education.

- Garner, N., Hayes, S. M. & Eilks, I. (2014). Linking Formal and Non-Formal Learning in Science Education – A Reflection from Two Cases in Ireland and Germany. *Sisyphus Journal of Education*, 2(2) 10-31.
- Garner, N., Huwer, J., Siol, A., Hempelmann, R. & Eilks, I. (2015). On the Development of Non-Formal Learning Environments for Secondary School Students Focusing Sustainability and Green Chemistry. *Journal of Sciences Education Research and Education for Sustainable Development*, 1(1), 199-208. doi: 10.1039/9781782621942-00076.
- Garrecht, C., Bruckermann, T. & Harms, U. (2018). Students' Decision-Making in Education for Sustainability-Related Extracurricular Activities – A Systematic Review of Empirical Studies. *Journal of Sustainability*, 10(11), 3876-3945.
- Gedvilienė, G. & Baužienė, Z. (2008). Development of Social Skills of Children with Movement Disorders. *Journal of Special Education*, 1(18), 158–168.
- Geli, A.M., Collazo, L.M. & Mulà, I. (2019). Context and Evolution of Sustainability In The Spanish University Curriculum. *Journal of Environmental Education and Sustainability*, 1(1), 1102-1123.
- Gericke, N. & Shu-Nu, C.R. (2014). The Implementation of Education for Sustainable Development in Sweden: Investigating the Sustainability Consciousness Among Upper Secondary Students. *Journal of Science & Technological Education*, 32(1), 318-339. doi: <https://doi.org/10.1080/02635143.2014.944493>.
- Handayani, S. (2009). Muatan Life Skills dalam Pembelajaran di Sekolah: Upaya Menciptakan Sumber Daya Manusia yang Bermutu. *Prosiding Konferensi Internasional Pendidikan*, UPI – UPSI, Malaysia.
- Haney, J.J., Czerniak, C.M. & Lumpe, A.T. (1996). Teacher Beliefs and Intentions Regarding the Implementation of Science Education Reform Strands. *Journal of Research in Science Teaching*, 33(1), 971-993.
- Hattie, J. & Timperley, H. (2007). The Power of Feedback. *Journal of Educational Research*, 77(1), 81-92. doi: <https://doi.org/10.3102/003465430298487>.
- He, J. & Kappler, A. (2017). Recovery of Precious Metals from Waste Streams. *Journal of Microbiology and Biotechnology*, 10(1), 1194–1198. doi: [10.1111/1751-7915.12759](https://doi.org/10.1111/1751-7915.12759).
- Heinrich, M., Minsch, J., Rauch, F., Schmidt, E. & Vielhaber, C. (2007). *Bildung und Nachhaltige Entwicklung: Eine Lernende Strategie Für Österreich [Education and Sustainable Development: A Learning Strategie for Austria]*. Münster: Monsenstein & Vannerdat.
- HEU (Health and Education Unit of the Commonwealth Secretariat). (2016). *Overarching Elements of the SDGs (2015–2030)*. London: Commonwealth Secretariat.

- Hofstein, A. & Kesner, M. (2006). Industrial Chemistry and School Chemistry: Making Chemistry Studies More Relevant. *International Journal of Science Education*, 28(1), 1017-1039.
- Hoisington, A.J., Brenner, L.A., Kinney, K.A., Postolache, T.T., & Lowry, C.A. (2015). The Microbiome of The Built Environment and Mental Health. *Journal of Microbiome*, 3(60), 1-12. doi: 10.1186/s40168-015-0127-0.
- Holbreich, M. dkk (2012). Amish Children Living in Northern Indiana Have A Very Low Prevalence of Allergic Sensitization. *Journal of Allergy Clinic Immunology*, 129(1), 1671–1673.
- Holbrook, J. & Rannikmäe, M. (2007). The Nature of Science Education for Enhancing Scientific Literacy. *Journal of Science Education*, 29(1), 1347-1362.
- Holden M 2008 The Tough Minded and the Tender Minded: A Pragmatic Turn for Sustainable Development Planning and Policy Planning Theory & Practice. *Journal of Planning Theory and Practice*, 9(4), 475-496.
- Huckle, J. (1996). *Teacher Education : Huckle & S. Sterling (Edition)*. London: Earthscan.
- Huckle, J. (2013). Eco-Schooling and Sustainability Citizenship: Exploring Issues Raised by Corporate Sponsorship. *The Curriculum Journal*, 24(2), 206–223.
- Hussain, M.A., Christial, F. & Sheng, Y. (2015). How Can Microbiology Help Improve Global Food Security?. *Asia-Pacific Journal of Food Safety and Security*, 1(1), 20–26.
- IEEE (Institute of Electrical and Electronics Engineers). (2015). *Competencies – Request for Interest*. [Online]. Diakses dari <https://ieeesa.imeetcentral.com/ltsc/doc/WzIsMzc3M-zUxMDld/w-CompetenciesStudyGroupRequestForInterest> [21 Mei 2020].
- IHME (Institute for Health Metrics and Evaluation). (2018). *Findings from the Global Burden of Disease Study*. Seattle: IHME.
- International Food Policy and Research Institute. (2016). *Annual report*. Washington, DC: International Food Policy Research Institute (IFPRI). [Online]. Diakses dari <http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/130442> 2016 [12 Juni 2020].
- IPCC (International Panel on Climate Change). (2018). An IPCC Special Report on The Impacts of Global Warming of 1.5°C Above Pre-Industrial Levels and Related Global Greenhouse Gas Emission Pathways. [Online]. Diakses dari <https://www.ipcc.ch/sr15/> [29 Juni 2020].
- Jacquin, J. dkk. (2019). Microbial Ecotoxicology of Marine Plastic Debris: A Review on Colonization and Biodegradation by the "Plastisphere". *Journal of Microbiology*, 10(865), 1-16. doi: <https://doi.org/10.3389/fmicb.2019.00865>.

- Jahanihashemi, H., Babaie, M., Bijani, S., Bazzazan, M. & Bijani, B. (2018). Poverty as An Independent Risk Factor for Hospital Mortality in Community-Acquired Pneumonia: A Study in A Developing Country Population. *Journal of Clinic and Practice*, 72(1), 1-11. doi: <https://doi.org/10.1111/ijcp.13085>.
- Jain, S. (2011). Importance of Blending Academic and Life Skills. *Journal of Child Health*, 40(1), 72-84.
- Jensen, B.B. (2002). Knowledge, Action and Pro-Environmental Behaviour. *Journal of Environmental Education Research*, 8(1), 325-334.
- Jurevičienė, M., Kaffemanienė, I. & Ruškus, J. (2012). Concept and Structural Components of Social Skills. *Journal of Sport and Health Sciences*, 3(86), 42-52. doi: 10.33607/bjshs.v3i86.266.
- Kapanadze, M. & Eilks, I. (2014). Supporting Reform in Science Education in Middle and Eastern Europe - Reflections and Perspectives from the Project TEMPUS-Salis. *Journal of Mathematics, Science and Technological Education*, 10(1), 47-58.
- Kembel, S.W. dkk. (2014). *Architectural Design Drives the Biogeography Of Indoor Bacterial Communities*. New York: PLoS One.
- Kementerian Pendidikan Nasional. (2010). *Rencana Strategis Kementerian Pendidikan Nasional 2010-2014*. Jakarta : Kementerian Pendidikan Nasional.
- Kementerian Lingkungan Hidup. (2012a). *Informasi mengenai Adiwiyata*. [Online]. Diakses dari <http://www.menlh.go.id/informasi-mengenai-adiwiyata/> [6 Februari 2020].
- Kementerian Lingkungan Hidup. (2012b). *Status Lingkungan Hidup Indonesia*. Jakarta: Tidak diterbitkan.
- Kementerian Lingkungan Hidup. (2013). *Peraturan Menteri Lingkungan Hidup Nomor 05 Tahun 2013 tentang Pedoman Pelaksanaan Program Adiwiyata*. Jakarta: Tidak diterbitkan.
- Kim, J.Y. & Evans, T. (2015). Promoting Women's Health for Sustainable Development. *Journal of Women Health* , 386(9999), 1-10. doi: [10.1016/S0140-6736\(15\)60942-4](https://doi.org/10.1016/S0140-6736(15)60942-4).
- Kjeldsen, A., Price, M., Lilley, C., Guźniczak, E. (2019). *A Review of Standards for Biodegradable Plastics*. Glasgow: Industrial Biotechnology Innovation Centre.
- Kopnina, H. & Meijers, F. (2014). Education for Sustainable Development (ESD) Exploring Theoretical and Practical Challenges. *Journal of Sustainability in Higher Education*, 15(2), 188-207. doi: 10.1108/IJSHE-07-2012-0059.
- Kumar, R. & Kumar, P. (2017). Future Microbial Applications for Bioenergy Production: A Perspective. *Journal of Microbiology*, 8(450), 1-4 . doi: [10.3389/fmicb.2017.00450](https://doi.org/10.3389/fmicb.2017.00450).

- Landriany, E. (2014). Implementasi Kebijakan Adiwiyata dalam Upaya Mewujudkan Pendidikan Lingkungan Hidup di SMA Kota Malang. *Jurnal Kebijakan dan Pengembangan Pendidikan*, 2(1), 82-88. doi: <https://doi.org/10.22219/jkpp.v2i1.1739>.
- Lambrechts, W. Dkk. (2013). The Integration of Competences for Sustainable Development in Higher Education: An Analysis of Bachelor Programs in Management. *Journal of Cleaner Production*, 48(1), 65–73.
- Lecky, D.M. dkk. (2011). Development of an Educational Resource on Microbes, Hygiene and Prudent Antibiotic Use for Junior and Senior School Children. *Journal of Antimicroba Chemother*, 66(5), 23–31.
- Leemkuil, H., de Jong, T., de Hoog, R. & Christoph, N. (2003). KM Quest: A Collaborative Internet-Based Simulation Game, Simulation & Gaming. *Journal of Simulation and Gaming*, 34(1), 89–111.
- Lestari, K.E. (2015). *Penelitian Pendidikan Matematika*. Bandung: PT Refika Aditama.
- Lladó, S., López, M.R. & Baldrian, P. (2017). Forest Soil Bacteria: Diversity, Involvement In Ecosystem Processes, And Response To Global Change. *Journal of Microbiology Molecular*, 81(1), 1–16.
- Lozano, R., Lozano, F.J., Mulder, K., Huisingh, D. & Waas, T. (2013). Advancing Higher Education for Sustainable Development: International Insights and Critical Reflections. *Journal of Cleaner Production*, 48(1), 3-9.
- Martin, J., McCormack, B., Fitzsimons, D. & Spirig, R. (2014). The Importance of Inspiring A Shared Vision. *International Practice Development Journal*, 4(2), 1-15.
- Mattos, T., MacKinnon, M. & Boorse, D. (2012). *The Intersection of Gender, Education, and Health: A Community level Survey of Education and Health Outcomes for Women in Southeastern Togo*. Wenham: Gordon College.
- McKeown, R. (2006). *Education for sustainable development toolkit*. [Online]. Diakses dari <http://unesdoc.unesco.org/images/0015/001524/152453eo.pdf> [18 Mei 2020].
- McLaughlin, J.M., Johnson, M.H., Kagan, S.A. & Baer, S.L. (2015). Clinical and Economic Burden of Community-Acquired Pneumonia in The Veterans Health Administration. *Journal of Infection*, 43(1), 671–680. doi: [10.1007/s15010-015-0789-3](https://doi.org/10.1007/s15010-015-0789-3).
- Megharaj, M. & Naidu, R. (2017). Soil and Brownfield Bioremediation. *Journal of Microbiology and Biotechnology*, 10(1), 1244–1249.
- Milandri, M. (2004). Children's Views of Microbes: Current Beliefs About Bacteria in Italian Grade School Children. *Journal of Pediatric Infectious Diseases*, 23(1), 1077–1080.
- Mohebbi, N., Akhlaghi, F., Hossein, M., Yarmohamadian. & Khoshgham, M. (2011). Application of CIPP Model for Evaluating The Medical Records

- Education Course at Master of Science Level at Iranian Medial Sciences Universities. *Journal of Social and Behavioral Sciences*, 15(1), 3286-3290.
- Marks, R. & Eilks, I. (2009). Promoting Scientific Literacy Using A Socio-Critical and Problem-Oriented Approach to Chemistry Teaching: Concept, Examples, Experiences. *Journal of Environmental and Science Education*, 4(1), 231-245.
- Marks, R., Stuckey, M., Belova, N., & Eilks, I. (2014). The Societal Dimension in German Science Education – From Tradition Towards Selected Cases and Recent Developments. *Eurasia Journal of Mathematics, Science and Technological Education*, 10(1), 285-296.
- Millar, M. & Schrier, T. (2015). Digital or Printed Textbooks: Which do Students Prefer and Why?. *Journal of Teaching in Travel & Tourism*, 15(1), 166–185. doi: 10.1080/15313220.2015.1026474.
- Mogren, A. & Gericke, N. (2016). ESD Implementation at the School Organisation Level, Part 1 – Investigating the Quality Criteria Guiding School Leaders’ Work at Recognized ESD Schools. *Journal of Environmental Education Research*, 23(1), 972–992.
- Montenegro, C. & Patrinos, H.A. (2014). *Comparable Estimates of Returns to Schooling around the World*. *Journal of Policy*, 1(1), 1-41.
- Narancic, T. & O'Connor, K.E. (2017). Microbial Biotechnology Addressing the Plastic Waste Disaster. *Journal of Microbiology and Biotechnology*, 10(1), 1232–1235.
- Nursadiah., Suyana, I. & Ramalis R.R. (2018). Profil Sustainability Awareness Siswa Melalui Integrasi ESD dalam Pembelajaran Berbasis Masalah pada Topik Energi Di SMP. *Prosiding Seminar Nasional Fisika (SINAFI)*. (hlm. 207-212). Bandung: UPI Press.
- Nikolopoulou, A., Abrahamâ, T. & Farid, M. (2010). *Education for Sustainable Development Challenges, Strategies, and Practices in a Globalizing World*. New Delhi: Sage Publication India.
- Okafor, N. (1992). *Commercialization of fermented foods in Sub-Saharan Africa: Applications of Biotechnology to Fermented Foods: Report of an Ad Hoc Panel of the Board on Science and Technology for International Development*. Washington, DC: National Academy Press.
- Osborn, D., Cutter, A. & Ullah, F. (2015). *Universal Sustainable Development Goals: Understanding the Transformational Challenge for Developed Countries*. [Online]. Diakses dari [https://sustainabledevelopment.un.org/content/documents/1684SF -
SDG Universality Report - May 2015.pdf](https://sustainabledevelopment.un.org/content/documents/1684SF_-_SDG_Universality_Report_-_May_2015.pdf) [16 Mei 2020].
- Osit, M. (2008). *Generation Text: Raising Well-Adjusted Kids in an Age of Instant Everything*. New York: AMACOM.

- Osman, A., Sultana, L., Emma F. & Veronica, M. (2017). *Curriculum Framework for the Sustainable Development Goals First Edition*. London: Commonwealth Secretariat.
- Paden, M. (2000). *Education for Sustainability and Environmental Education*. New York: Kluwer.
- Paerl, H.W. (2017). Controlling Cyanobacterial Harmful Blooms in Freshwater Ecosystems. *Journal of Microbiology and Biotechnology*, 10(1), 1106–1110.
- Pardjono. (2003). Representasi Eklektisisme pada Kurikulum SMK berbasis Kompetensi yang Berorientasi Kecakapan Hidup. [Online]. Diakses dari: <http://www.staff.uny.ac.id> [18 Desember 2020].
- Pauw, J B., Gericke, M., Olsson, D. & Berglund, T. (2015). The Effectiveness of Education for Sustainable Development. *Journal of Sustainable Education and Approaches*, 7(11), 15693-15717. doi: <https://doi.org/10.3390/su71115693>.
- Peters, S.A.E., Norton, R., Jha, V., Kennedy, S. & Woodward, M. (2016). Women's Health: A New Global Agenda. *Journal of Global Health*, 1(1). doi: [10.1136/bmjgh-2016-000080](https://doi.org/10.1136/bmjgh-2016-000080).
- Pruneau, D. dkk. (2014). Leaders of Sustainable Development Projects: Resources Used and Lessons Learned in a Context of Environmental Education?. *Journal of Education for Sustainable Development*, 8(2), 155-169. doi: [10.1177/0973408214548382](https://doi.org/10.1177/0973408214548382).
- Purwadi, A. (2009). *EFSD in Indonesia at a Glance in EFSD Currents: Changing Perspective from The Asia-Pacific*. Bangkok: UNESCO.
- Rauch, F. (2004). *Education for Sustainability: A Regulative Idea and Trigger for Innovation*. London: Routledge Falmer.
- Redclift, M. (1984). *Development and the Environmental Crisis*. Abingdon: Routledge.
- Richardson, A.E. & Simpson, R.J. (2011). Soil Microorganisms Mediating Phosphorus Availability. *Journal of Plant Physiology*, 156(1), 989–996.
- Rowe, D. (2007). Education for a Sustainable Future. *Journal of Sustainability*, 317(1), 323-324.
- Rudawska, E., Renko, S. & Bilan, Y. (2013). *A Discussion of the Concept of Sustainable Development – Examples of Polish, Croatian and Ukrainian Markets*. Ternopil: KrokBooks.
- Rychen, D. & Tiana, A. (2004). *Developing Key Competencies in Education: Some Lessons from International and National Experience*. Geneva: International Bureau of Education.
- Sachs, J., Schmidt, T.G., Kroll, C., Lafortune, G., Fuller, G. & Woelm, F. (2020). The Sustainable Development Goals and COVID-19. *Sustainable Development Report 2020*. Cambridge: Cambridge University Press.

- Sadler, T.D. (2011). *Socio-Scientific Issues in The Classroom*. Dordrecht: Springer.
- Sarker, S.A., Ahmed, T. & Brüssow, H. (2017). Hunger and Microbiology: is A Low Gastric Acid-Induced Bacterial Overgrowth in The Small Intestine A Contributor to Malnutrition in Developing Countries?. *Journal of Microbiology and Biotechnology*, 10(1), 1025–1030.
- Schmedes, S.E., Sajantila, A. & Budowle, B. (2016). Expansion of Microbial Forensics. *Journal of Clinical Microbiology*, 54(1), 1964–1974.
- Schmidt, D.C. (2017). The Future of Biologically Inspired Next-Generation Factories for Chemicals. *Journal of Microbiology and Biotechnology*, 10(1), 1164–1166.
- Scholz, R. W., Lang, D. J., Wiek, A., Walter, A. I., & Stauffacher, M. (2006). *Transdisciplinary Case Studies as A Means of Sustainability Learning*. *Journal of Sustainability in Higher Education*, 7(3), 226–251.
- SDSN. (2017). Getting Started with the SDGs in Universities: A Guide for Universities, Higher Education Institutions, and the Academic Sector. [Online]. Diakses dari http://ap-unsdsn.org/wp-content/uploads/University-SDG-Guide_web.pdf [10 Maret 2020].
- Shakya, V.K. (2016). Developing Life Skills Education for Sustainable Development of Students. *Journal of Applied Research*, 2(6): 416–418.
- Sharma, A. dkk. (2019). Longitudinal Homogenization of the Microbiome Between Both Occupants and the Built Environment in A Cohort of United States Air Force Cadets. *Journal of Microbiome*, 7(70), 1–17.
- Singh, M. (2003). *Understanding Life Skills*. [Online]. Diakses dari: <https://unesdoc.unesco.org/ark:/48223/pf0000146963> [13 April 2020].
- Sipos, Y., Battisi, B. & Grimm, K. (2008). Achieving Transformative Sustainability Learning: Engaging Head, Hands And Heart. *International Journal of Sustainability in Higher Education*, 9(1), 68–86.
- Sjöström, J., Rauch, F., Eilks, I. (2015). *Chemistry Education for Sustainability*. Rotterdam: Sense in print.
- Smith, J.T. (2003). *Early Childhood Development: A Multicultural Perspective Third Edition Columbus*. Ohio: Upper Saddle River, New Jersey.
- Steidinger, B.S. dkk. (2019). Climatic Controls of Decomposition Drive the Global Biogeography of Forest-Tree Symbioses. *Journal of Nature*, 569(1), 404–408.
- Sterling, S. (2014). Separate Tracks or Real Synergy? – Achieving A Closer Relationship Between Education and SD. *Journal of Education for Sustainable Development*, 8(1), 89–112.
- Stolz, M., Witteck, T., Marks, R. & Eilks, I. (2013). Reflecting Socio-Scientific Issues for Science Education Coming from the Case of Curriculum

- Development on Doping in Chemistry Education. *Eurasia Journal of Mathematics, Science and Technological Education*, 9(1), 273-282.
- Stuckey, M., Mamlok, N.R., Hofstein, A. & Eilks, I. (2013). The Meaning of Relevance In Science Education and its Implications for the Science Curriculum. *Journal of Science Education*, 49(1), 1-34.
- Stufflebeam, D.L. dkk. (1971). *Educational Evaluation and Decision Making* (Chapters 3, 7, & 8). Itasca: Peacock.
- Stufflebeam, D.L. (2003). *The CIPP Model of Evaluation. Conference of the Oregon Program Evaluators Network (OPEN) in Oregon*. Portland: Western Michigan University.
- Suryana. (2010). *Metodologi Penelitian Model Praktis Penelitian Kuantitatif dan Kualitatif*. [Online]. Diakses dari http://file.upi.edu/Direktori/FPEB/PRODI_MANAJEMEN-_FPEB/196006021986011-SURYANA/FILE__7.pdf.
- Syakur, A. (2017). Education for Sustainable Development (ESD) sebagai Respon dari Isu Tantangan Global melalui Pendidikan Berkarakter dan Berwawasan Lingkungan yang diterapkan pada Sekolah Dasar, Sekolah Menengah dan Kejuruan di Kota Malang. *Jurnal Pendidikan dan Sains*, 1(1), 37-47.
- TDR/WHO. (2019). *TDR 2018 Annual Report: Building the Science of Solutions*. Geneva: World Health Organization.
- Teach Task Force. (2020). The Futures of Teaching Final Report. *Proceedings of the Annual Meetings and 12th Policy Dialogue Forum, Dubai, United Arab Emirates*.
- Tilman, D., Balzer, C., Hill, J. & Befort, B.L. (2011). Global Food Demand and the Sustainable Intensification of Agriculture. *Journal of Science*. 108(50) 20260–20264. doi: <https://doi.org/10.1073/pnas.1116437108>.
- Timmis, K. dkk. (2017). The Contribution of Microbial Biotechnology to Economic Growth and Employment Creation. *Journal of Microbial Biotechnology*, 10(1), 1137–1144.
- Timmis, K., Cavicchioli, R., Garcia, J.L, Nogales, B. & Chavarría, M. (2019). The Urgent Need for Microbiology Literacy in Society. *Journal of Environmental Microbiology*, 21(1), 1513–1528.
- Turangan, T.M.B., Simandjuntak, S. & Arrijani. (2020). The Implementation of the Environmental Education in Junior High School in Manado. *Proceedings of International Conference on Education, Science and Technology*, Manado.
- UN DESA (United Nations Department of Economic and Social Affairs). (2019). *World Population Prospects 2019*. [Online]. Diakses dari <http://population.un.org/wpp>.
- UNESCO and the Indian National Commission for Co-operation with UNESCO. (2001). *Life Skills in Non-formal Education: A Review*.

Indira Kartika Rahayu, 2021

IMPLEMENTASI EDUCATION FOR SUSTAINABLE DEVELOPMENT (ESD) DAN PENCAPAIAN LIFE SKILLS PESERTA DIDIK DI SEKOLAH ADIWiyATA MANDIRI

Universitas Pendidikan Indonesia | repository.upi.edu | perpustakaan.upi.edu

- UNESCO. (2005a). *Education for Sustainable Development: ESD Information Briefs*. [Online]. Diakses dari <http://portal.unesco.org/education/en/ev.php> [16 Mei 2020].
- UNESCO. (2005b). *Draft Report of the Inter-Agency Working Group on Life Skills in EFA*. Paris: UNESCO.
- UNESCO.(2005c). Focusing Resources on Effective School Health. 2005c. [Online]
http://portal.unesco.org/education/en/ev.phpURL_ID=36637&URL_DO=DO_TOPIC&URL_SECTION=201.html. [16 Mei 2020].
- UNESCO (2005d). *Teaching and Learning for A Sustainable Future – A Multimedia Teacher Education Programme*. [Online]. Diakses dari www.unesco.org/education/tlsf/index.html [1 Mei 2020].
- UNESCO. (2006a). Education for sustainable development. [Online]. Diakses dari <https://unesdoc.unesco.org/ark:/48223/pf0000152453> [Diakses 5 Maret 2020].
- UNESCO. (2006b). *Promotion of a Global Partnership for the UN Decade of Education for Sustainable Development: The International Implementation Scheme for the Decade in brief*. [Online]. Diakses dari : <http://unesdoc.unesco.org/images/0014-/001473/147361E.pdf> [6 Maret 2020].
- UNESCO. (2014). *World Conference on Education for Sustainable Development calls for renewed commitment by all countries*. [Online]. Diakses dari http://www.unesco.org/new/en/mediaservices/singleview/news/world_conference_on_education_for_sustainable_development_calls_for_renewed_commitment_by_all_countries/back/9597/#.VXrYclyeDGe [18 Januari 2020].
- UNESCO. (2016). *Incheon Declaration and Framework for Action. Towards inclusive and equitable quality education and lifelong learning for all*. Paris: UNESCO.
- UNESCO. (2017). *Education for Sustainable Development: Learning Objectives*. Paris: UNESCO.
- UNESCO. (2019). *Beyond commitments – How countries implement SDG 4*. Paris: UNESCO.
- United Nations. (2015). *Transforming Our World: the 2030 Agenda for Sustainable Development*. [Online]. Diakses dari http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E [9 April 2020].
- UN (United Nations). (2019). Degradation of Plastics And Plastic-Degrading Bacteria In Cold Marine Habitats. *Journal of Application Microbiolal Biotechnology*, 102(1), 7669–7678.
- UNWCD (United Nations World Commission on Environment and Development). (1987). *Report of the World Commission on Environment*

- and Development: Our Common Future*. [Online]. Diakses dari <http://www.un-documents.net/our-commonfuture.pdf> [10 April 2020].
- Urbanek, A.K., Rymowicz, W., Mirończuk, A.M. (2018). Degradation of plastics and plastic-degrading bacteria in cold marine habitats. *Journal of Application in Microbiology and Biotechnology*, 102(1), 7669–7678.
- Valencia, M I. C. (2018). Introducing Education for Sustainable Development (ESD) in the Educational Institutions in the Philippines. *Journal of Sustainable Development Education and Research*, 2(1), 51-57. doi: <https://doi.org/10.17509/jsder.v2i1.12358>.
- Vavilala, M.P., Shukla, T., Dosaya, D. & Nirban, V.S. (2020). *Education for Sustainable Development: Towards Skill Development and Human Resource Management*. [Online]. Diakses dari <https://cies2020.org/portfolio/role-of-life-skills-in-education-for-sustainable-development/> [29 Agustus 2020].
- Wang, Y.Z. dkk. (2017). Improving the Extracellular Electron Transfer of *Shewanella Oneidensis* MR-1 For Enhanced Bioelectricity Production from Biomass Hydrolysate. *Journal of Advance Research*, 7(1), 30488–30494.
- Warju, H.S.P., Soenarto. & Hartmann, M.D. (2017). Evaluating the Implementation of Green School (Adiwiyata) Program: Evidence from Indonesia. *Journal of Environmental and Sciences Education*, 12(6), 1483-1501.
- Watanabe, R. (2015). *Implementation of Education for Sustainable Development (ESD) in Japan: Master Programme in International and Comparative Education*. Stockholm: Tidak diterbitkan.
- West, C.E. dkk. (2015). The Gut Microbiota and Inflammatory Noncommunicable Diseases: Associations and Potentials for Gut Microbiota Therapies. *Journal of Allergy Clinic Immunology*, 135(1), 3–13.
- Wheeler, S.M. (2000). Planning for Metropolitan Sustainability. *Journal of Planning Education and Research*, 20(1), 133-145. doi: 10.1177/0739456X0002000201.
- WHO (World Health Organisation). (2009). *Women and Health: Today's Evidence Tomorrow's Agenda*. Geneva: World Health Organization.
- WHO. (2017). *WHO-GLASS Global Antimicrobial Resistance Surveillance System (GLASS) Report: Early implementation 2016-2017*. Geneva: World Health Organization.
- Wibowo, Y.G. & Sadikin, A. (2019). Biology in the 21st-Century: Transformation in Biology Science and Education in Supporting the Sustainable Development Goals. *Jurnal Pendidikan Biologi Indonesia*, 5(2), 285-296.
- Wiek, A. dkk. (2016). *Operationalising Competencies in Higher Education for Sustainable Development*. in: *Matthias Barth, Gerd Michelsen, Ian Thomas*,

- Marco Rieckmann (eds.): *Routledge Handbook of Higher Education for Sustainable Development*. London: Routledge.
- Wolters, M. dkk. Dietary Fat, the Gut Microbiota, and Metabolic Health - A Systematic Review Conducted within the Mynewgut Project. *Journal of Clinic and Nutrition*, 38(1), 2504–2520.
- World Health Organization. (1997). *Life Skills Education for Children and Adolescents in Schools: Introduction and Guidelines to Facilitate the Development and Implementation of Life Skills Programmes*. Geneva: WHO.
- World Bank. (2018). *Poverty and Shared Prosperity: Piecing Together the Poverty Puzzle*. Washington DC: World Bank.
- Yeung, S.K., So, W.W., Cheng, N.I., Cheung, T.Y. & Chow, C.F. (2017). Comparing Pedagogies for Plastic Waste Management at University Level. *Journal of Sustainable in High Education*, 18(7), 1039–1059.
- Zifcakova, L., Vetrovsky, T., Howe, A. & Baldrian, P. (2016). Microbial Activity in Forest Soil Reflects the Changes in Ecosystem Properties Between Summer and Winter. *Journal of Environment and Microbiology*, 18(1), 288–301.
- Zint, M., Kraemer, A. & Kolenic, G. (2014). Evaluating Meaningful Watershed Educational Experiences: An Exploration into the Effects on Participating Students' Environmental Stewardship Characteristics and the Relationships Between These Predictors of Environment. *Journal of Educational Evaluation*, 41(1), 4-17. doi: <http://doi.org/10.1016/j.stueduc.2013.07.002>.